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The thermochemistry of solvation of imidazolium-based ionic liquids in benzene

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Abstract

© 2018, © 2018 Informa UK Limited, trading as Taylor & Francis Group. The present work is devoted to the thermochemical study of solvation of ionic liquids (IL) in benzene. The solution enthalpies of 1-ethyl-3-methylimidazolium tricyanomethanide [EMIM][C(CN)3], 1-butyl-3-methylimidazolium tetrafluoroborate [BMIM][BF4], 1-hexyl-3-methylimidazolium hexafluorophosphate [HMIM][PF6], 1-octyl-3-methylimidazolium tetrafluoroborate [OMIM][BF4], 1-ethyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide [EMIM][NTf2], 1-butyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide [BMIM][NTf2] and 1-butyl-3-methylimidazolium trifluoromethanesulfonate [BMIM][TfO] in benzene were measured. The solvation enthalpies of imidazolium-based IL were calculated. Molar refractions of imidazolium-based IL form literature data on density and refractive indexes of IL were also calculated. The linear correlation between solvation enthalpy and molar refraction of IL was observed. This correlation can be used to calculate the vaporization enthalpy of imidazolium-based IL from solution calorimetry data.

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Keywords

ionic liquids, Solution calorimetry, vaporization enthalpy

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